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(71)Applicant : FUJITSU LTD

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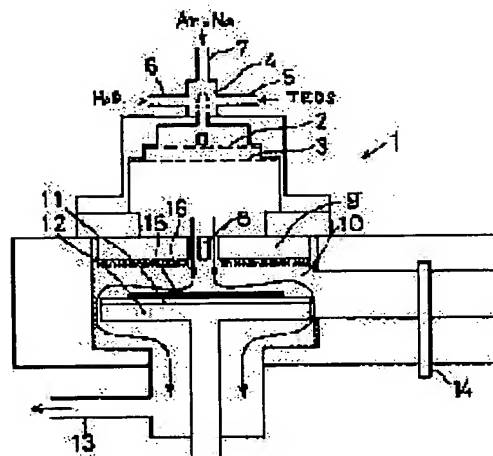
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AOKI YUSUKE

**(54) HIGH-FREQUENCY PLASMA CVD APPARATUS****(57) Abstract:**

**PROBLEM TO BE SOLVED:** To obtain a high-frequency plasma CVD apparatus by which a flattened insulating film is formed at high speed by a method wherein the electrode interval between a high-frequency electrode and a grounding electrode is set at a specific value or larger and the electrodes are arranged to generate a reaction while organic silane and a gas including a compound gas which contains H and OH are passed in a region between the electrodes as a pair in a direction parallel to electrode plates.

**SOLUTION:** A slit-shaped electrode interval which is formed of a high-frequency electrode 8 and a grounding electrode 9 is used, and a low-molecular-weight polymer is formed at the upper part of a substrate 15. Then, a method of supplying the low-molecular-weight polymer to the surface of the substrate by using the flow of a gas is used. The slit-shaped electrode interval is formed of the high-frequency electrode 8 and the grounding electrode 9 is set at 10mm or lower, preferably at 1 to 5mm. Then, a reaction is generated while a gas in a plasma state passes between the electrodes to a direction parallel to the electrodes.

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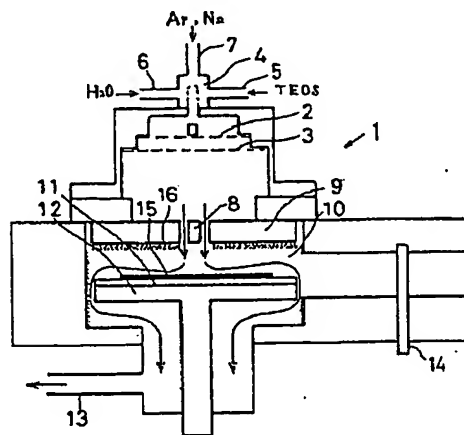
(54)【発明の名称】 高周波プラズマCVD装置

(57)【要約】

【目的】 高周波プラズマCVD装置に関し、高膜質の平坦化絶縁膜を高速で形成するための電極構造を有する高周波プラズマCVD装置を提供する。

【構成】 有機シランガスと、HおよびOH含有化合物ガスを含むガスを圧力100 Torr以上の低真空反応室内で励起させ、有機シランガスと、HおよびOH含有化合物ガスを含むガスを気相中または基板表面で反応させて基板上に少なくとも10000以下の流動性を有する低分子量重合体を形成する高周波プラズマCVD装置であって、有機シランガスと、HおよびOH含有化合物ガスを含むガスを励起するための、10mm以下、好ましくは1mm～5mmの間隔で対向させ、高周波電力を印加する1対の電極を備える。1対の電極の間をプラズマ状態のガスが通過する時間を制御して反応を調節するために、流速を制御する多孔板等のシャワー板を設ける。1対の電極の後段に、酸化性または還元性ガスを供給する手段を設ける。

第1実施例の高周波プラズマCVD装置の構成説明図



- |                            |           |
|----------------------------|-----------|
| 1: 匣体                      | 9: 接地電極   |
| 2: 拡散板                     | 10: 反応室   |
| 3: シャワー板                   | 11: サセプタ  |
| 4: 攪拌室                     | 12: 加熱器   |
| 5: TEOS導入口                 | 13: 排気口   |
| 6: H <sub>2</sub> O導入口     | 14: ゲート   |
| 7: ArまたはN <sub>2</sub> 導入口 | 15: 基板    |
| 8: 高周波電極                   | 16: 吸着重合体 |

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(21) Application number : 2000-299280 (71) Applicant : TOKYO ELECTRON LTD  
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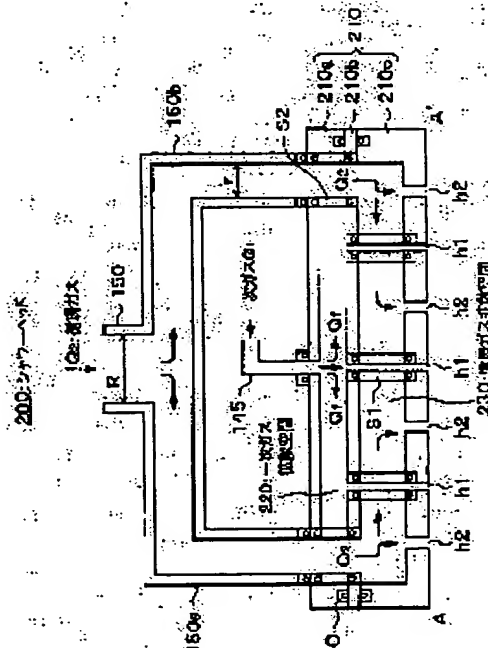
(54) PROCESSOR

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a processor which can easily control circulation gas.

SOLUTION: The processor 100 is equipped with a shower head 200 supplying processing gas into a process chamber through plural gas supply holes, a turbopump 120 exhausting processing gas from the process chamber 110 and a circulation gas piping 150 returning at least a part (circulation gas Q2) of exhaust gas exhausted from within the process chamber by the turbopump to the shower head. The shower head is provided with a primary gas supply system supplying primary gas Q1 supplied from a gas source 140 into the process chamber through plural primary gas jet holes h1, and a circulation gas supply system supplying circulation gas into the process chamber through plural circulation gas supply holes.

The primary gas supplying system and the circulation gas supply system are constituted as independent systems. Since primary gas and circulation gas can be mixed in the process chamber for the first time, circulation gas can easily be controlled even if pressure control is not conducted.



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